



City of Charleston All Hazards Vulnerability and Risk Assessment

Resiliency & Sustainability Advisory Committee

Nov 12, 2020



NEMAC+FernLeaf



Collective
WATER RESOURCES

Kimley»Horn

JOYST
COMMUNICATIONS



What is the Assessment?

A resource for City leaders and staff to continuously assess and better manage impacts from hazard events

- Integrates with the City's Flooding and Sea Level Rise Strategy, the Dutch Dialogues, and other planning efforts.
- Uses trusted sources of information and best practice (NOAA's Steps to Resilience) to quantify vulnerability and risk to hazards.
- Solutions-oriented and informs targeted use of limited resources—in a complex and changing world.



PROPERTY AND PUBLIC SERVICES

Businesses

Homes

Government functions

Critical facilities (schools and public safety)

Parks and cultural resources



ROADS & MOBILITY

Access to critical services



ECONOMY

Annual sales volume

Jobs and employees



PEOPLE AND SOCIOECONOMICS

Sensitive populations

Public housing

SNAP food retailers

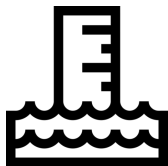


Hazards

Which *Hazards* are most likely to harm people and communities and cause loss to or failure of Core Systems in the City of Charleston?



FLOODING



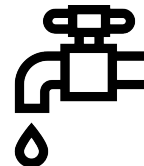
SEA LEVEL
RISE



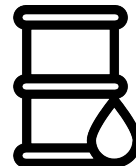
EARTHQUAKES



EXTREME
HEAT



WATER
SHORTAGE



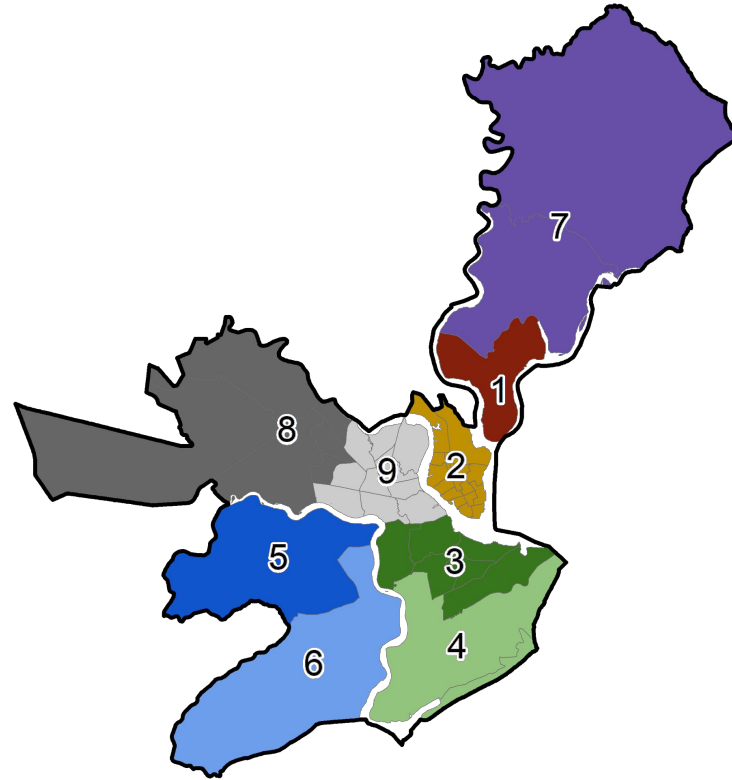
HAZMAT


Same exposure, different vulnerability



Areas of the City

1. Daniel Island
2. Downtown/Peninsula
3. James Island (North)
4. James Island (South)
5. Johns Island (North)
6. Johns Island (South)
7. Cainhoy
8. West Ashley (Outer)
9. West Ashley (Inner)



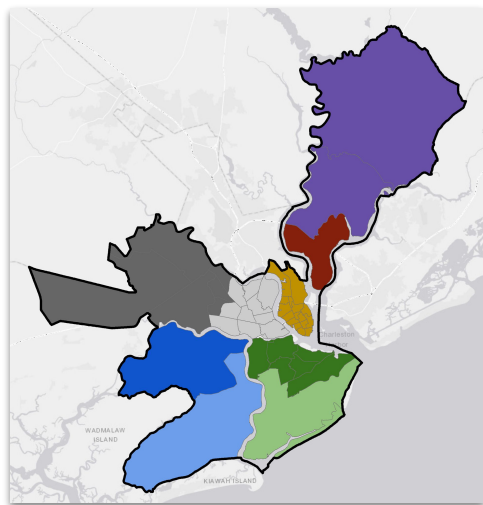


Finding: Highest levels of vulnerability citywide are to flooding, storm surge, and earthquake hazards

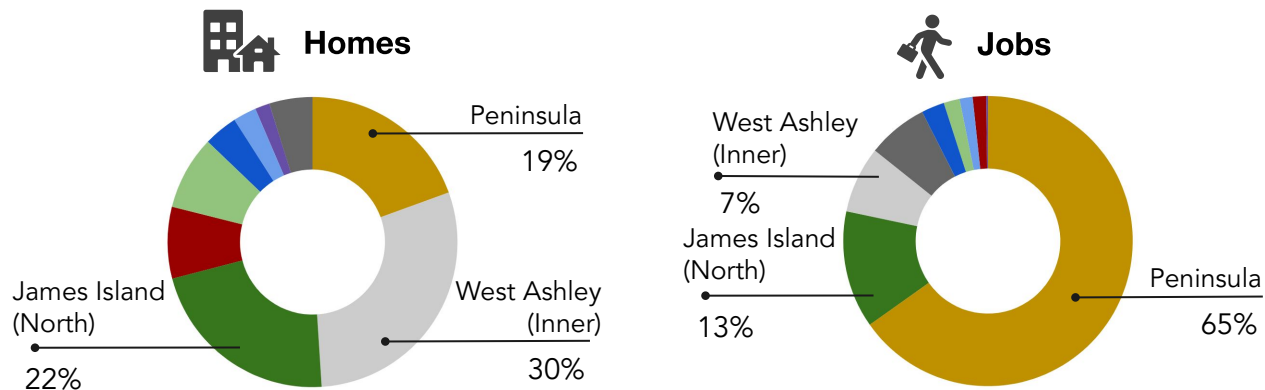
	Floodplain Inundation	Storm Surge	Earthquake
Businesses	2,379 (71%)	2,832 (84%)	1,563 (46%)
Homes	43,116 (70%)	53,918 (87%)	24,456 (39%)
Critical Facilities (schools, utilities, public safety)	205 (59%)	249 (72%)	304 (88%)

Note: numbers are the number of property parcels; earthquake assessment only focused on vulnerability

Finding: Certain areas of the city contain high proportions of the citywide vulnerability and risk



Citywide Vulnerability and Risk to Floodplain Inundation



Finding: Increased frequency and severity of tidal flooding will be a primary impact of sea level rise

3 ft above MHHW
(2030-2100)

**Major roads
inaccessible**

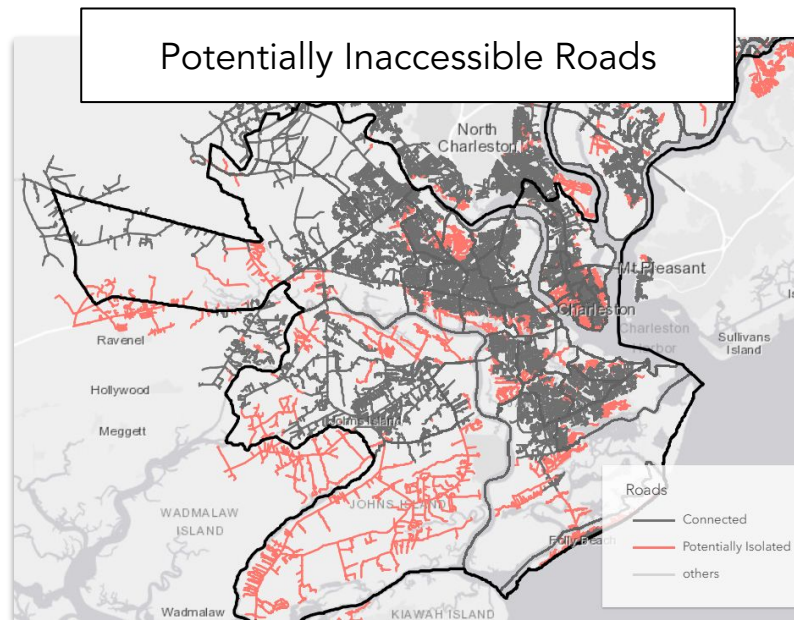
10%

**Minor roads
inaccessible**

25%

**Property
inaccessible**

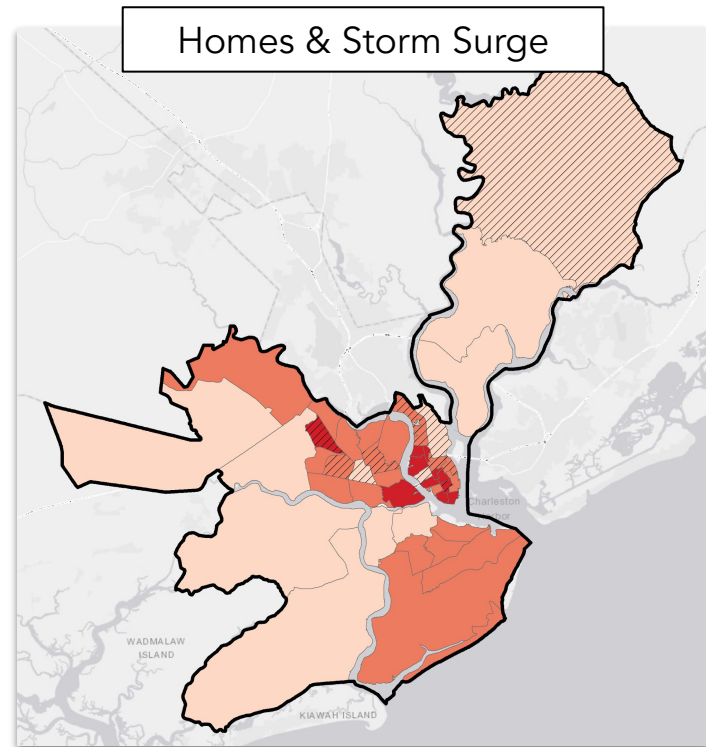
15,000
(22%)



Finding: Areas vulnerable to hazards are also socially vulnerable

Example: Storm Surge

- About 96% of homes in the most socially vulnerable neighborhoods are vulnerable to storm surge
- Public Housing: 102 (99%)
- SNAP Retailers: 117 (96%)



Alignment with the City's Critical Components

- Assessment integrates and builds on the City's **Flooding & Sea Level Rise Strategy**
- Recognizes holistic approach needed for building resilience

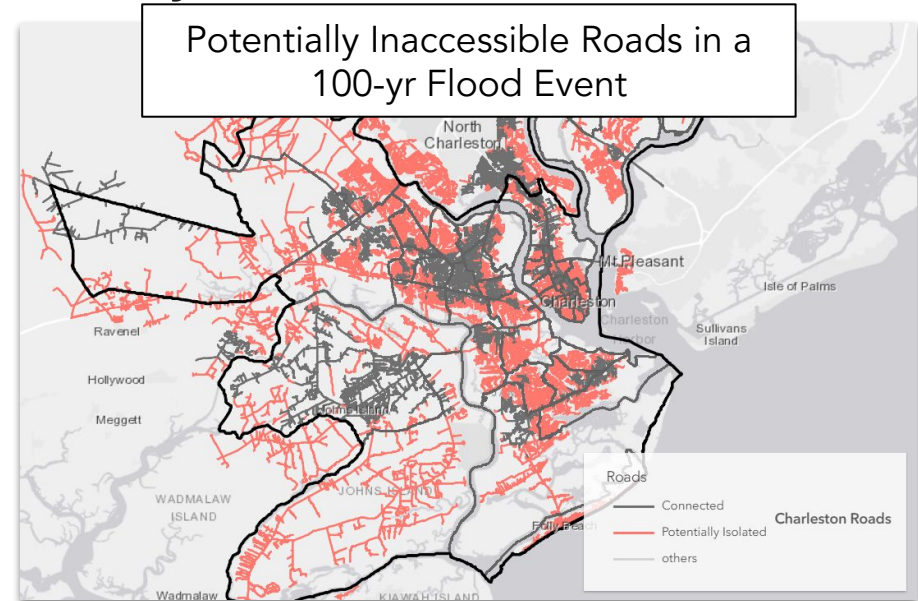


Strategy: Acquire appropriate flood response assets for public safety

RESOURCES



- 86% of properties citywide could be inaccessible to emergency response in a major flood event
- Assessment helps to inform how and where to prioritize resources





The assessment can inform pathways to a resilient future

Limited resources means that every issue cannot be addressed. Three types of risks that all require planning for today and additional stakeholders to address:

Near-term

Flooding, Tidal Flooding (with current sea level rise), Hazardous Materials

Long-term future change

Sea Level Rise and Future Tidal Flooding, Extreme Heat

High-impact event

Storm Surge, Earthquake

Final Report

- Assessment Summaries
- Key Findings
- Options and Priorities
- Appendix
 - Technical Documentation
 - General Area Reports
 - 2-Page Asset-Hazard Profiles
 - All Options

All Hazards Vulnerability and Risk Assessment





Thank you!

We want to give a special thanks to City staff.



NEMAC+FernLeaf



Collective
WATER RESOURCES

Kimley»»Horn

JOYST
COMMUNICATIONS